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A mailed questionnaire survey of public high schools in California and Oregon was conducted to determine if differences exist in the length of tenure and the recruitment of personnel in schools stratified on the basis of adoption of four innovations: Teacher aides, team teaching, variation in class size, and variation in length of class period. Rate of response was 64% from California schools and 68% from Oregon schools. Minor distinctions reduced analysis to responses from 105 schools in Oregon and 309 in California. Dependent variables, for which correlation to adoption of innovations was determined, included superintendedt tenture, principal tenure, faculty tenure, district size, school size, and expenditure per pupil. Testing of five major hypotheses indicated that length of tenure of superintendents, principals, and faculty is not significantly correlated with adoption of educational innovations. In California the manner of recruitment of superintendents (from within or outside the system) is supported as a determinant of high, medium, or low structural innovation. Testing of three minor hypotheses generally yielded a positive correlation between the extent of structural innovation and the three variables of mean size of district enrollment, mean size of individual school enrollment, and mean expenditure per pupil. (JK)

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The Relationship of Staff Tenure and Administrative Succession to Structural Innovation*

by Paul P. Preising

INTRODUCTION

The problem of implementing change in public secondary schools has intensified due to greater opportunities for innovation made possible through increased funds. Since the implementation of change seldom goes smoothly, the quest for further understanding of variables related to innovation in secondary schools appears to be warranted.

It is apparent that the term innovation is applied to a wide range of problems in education. Innovation, as a general category of change in schools, has been studied extensively. However, few investigations have actually focused upon the study of specific categories of innovation.

Several researchers have urged that the study of innovation treat the category or type of innovation as a critical dimension. Brickell[1] points up this problem and suggests that there is a need to separate the study of innovation which involves changes in staff arrangements, time, and the schedule from the study of innovation which involves other classes of change in schools.

Miles,[2] in support of Brickell's approach to the study of innovation and its implementation, claims that promising lines of inquiry on innovation include the study of the attributes of the innovations themselves as well as the characteristics of the innovative person or group.

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Griffiths[3] implies that a crucial organizational variable is the length of tenure of the chief administrator. The longer the tenure, he says, the less the possibility of change.

Another characteristic claimed by both Griffiths[4] and Carlson[5] as having an important effect upon implementation of innovation in schools is the recruitment pattern of administrators. The presence of "outsiders," they say, increases the possibility of change.

If it can be demonstrated that the length of tenure of personnel and recruitment of administrators differ among schools stratified on the basis of adoption of specific categories of innovation, greater control of the process of innovation should be possible. In addition, implications for the development of theory of educational innovation should emerge.

THE PROBLEM

The purpose of the current investigation is to determine if differences exist in the length of tenure and the recruitment of personnel in schools stratified on the basis of adoption of a selected category of innovations. Three domains of variables are investigated in this aspect of the study. The first domain comprises (1) superintendent's length of tenure in the district, (2) principal's length of tenure in the school, and (3) mean length of faculty tenure in the school. The second domain comprises (1) superintendent's and (2) principal's sources of recruitment. The third domain encompasses (1) size of district, (2) size of school, and (3) expenditure per pupil.

The category of innovation selected for study is designated as structural innovations are defined here as those innovations requiring changes in the elements which order the operations and functions of the entire organization. Structural innovation is further distinguished in this study from nonstructural innovation by referring to changes that cut across classroom and departmental boundaries and that are not restricted to the content or organization of one or a few subject fields. These organizational elements in schools include such items as the time schedule and pattern of staffing arrangements. Examples of structural innovation include use of teacher aides, use of team teaching, use of variation in class size, and use of variation in length of class meetings.

The nature of these structural innovations leads to the expectation that the formal leader of the organization, the superintendent in the case of the district and the principal in the case of the school, will play a major role in their introduction.

TOWARD THE DEVELOPMENT OF A RATIONALE

Among the researchers who have studied innovation in education are Mort,[6] Ross,[7] Brickell,[8] Miles,[9] Reynolds,[10] Carlson,[11] Bigelow,[13], Gross and Herriott,[14] Atwood,[15] and Ramstad.[16]

Brickell[17] noted that the study of non-structural innovation has far exceeded the study of structural innovation. Mort[18] discovered that acceptance of an innovation by school districts within a county follows a slow but predictable curvilinear pattern. Ross[19] found that, on the average, the larger the district (up to about 100,000 population) the greater the probability that changes are implemented. A recent study by Reynolds[20] confirms this finding. Bigelow[21] found that acceptance of innovation is positively associated with financial support.

Carlson[22] found that the chief school administrator was important explanatory element in the adoption of change. In Allegheny County, Pennsylvania and in West Virginia, he found that superintendents with high peer status tended to adopt modern mathematics earlier than those scoring low on peer status. Reynolds[23] found that innovation was associated with short-tenured superintendents recruited from outside of the school district.

Brickell[24] claims that structural innovation depends almost exclusively upon administrative initiative. Reynolds[25] agrees and, further, suggests that the principal, rather than the superintendent, may be the critical agent of change at the school level.

Gross and Herriott[26] report that experience in the elementary principalship and EPL (Executive Professional Leadership) are negatively correlated. Their finding offers indirect support for the belief that length of tenure of the principal may be inversely proportional to structural innovation.

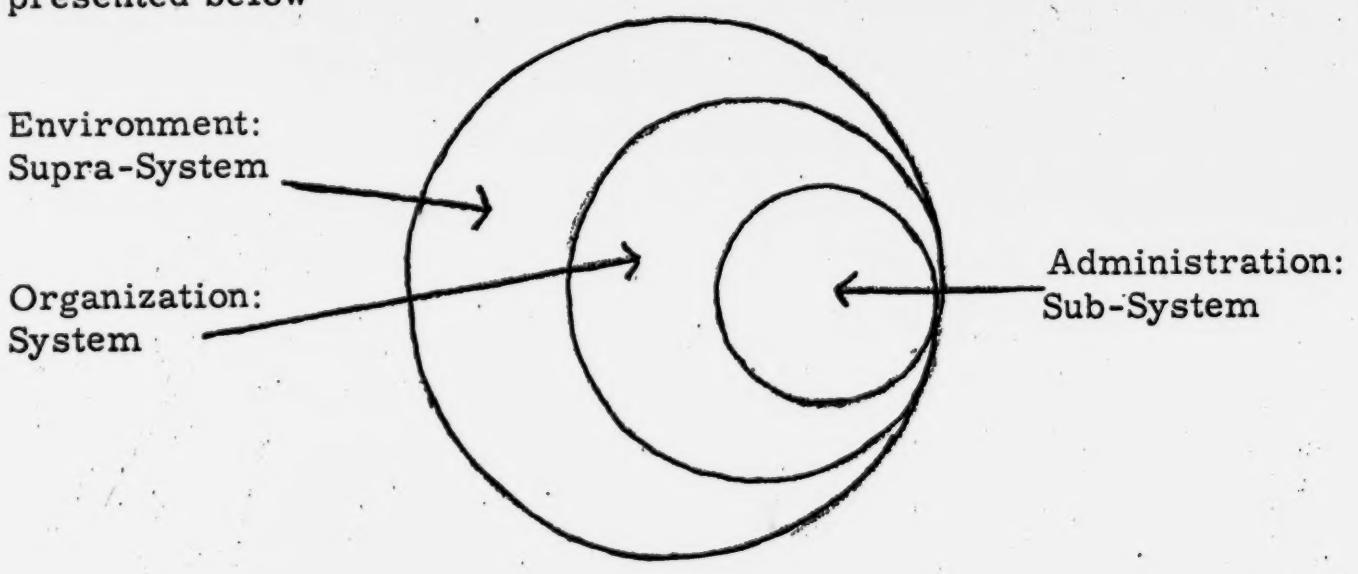
There is evidence that characteristics of school faculties are associated with structural innovation. Atwood[27] found that established teachers resisted the implementation of a new guidance program, whereas newcomers supported the change. He also found that newcomers were willing to initiate more change than older teachers. The inference can be made from Atwood's study that the mean length of faculty tenure is an index of the number of newcomers to a school and also of willingness to implement changes.

Griffiths[28] has built on the work of Hearn[29] and Miller[30] to develop a model for conceptualizing change in organizations. He views the school

as an open system possessing the following properties:

1. The capability of exchanging matter, energy, and information with their environments; that is, they have inputs and outputs.
2. The tendency to maintain the sub-systems within the organization in a state of equilibrium.
3. The capability of self-regulation.
4. The tendency toward equifinality. ("Equifinality" refers to the ability to effect identical results from initially different conditions.)
5. The presence of sub-systems whose dynamic interplay enables the system as a whole to survive. (For example, the objectives of the accounting sub-system to control expenditures check the tendency of the instructional sub-system to maximize expenditures.)
6. The existence of feedback mechanisms which are critical in the maintenance of the steady state of the system.
7. The segregation of the system into a hierarchy.

A graphic representation of the model, relating salient elements, is presented below



Propositions derived by Griffiths that are relevant to this study include

1. Change in organizations is relatively infrequent.
2. The number of innovations implemented in organizations is inversely proportional to the length of tenure of the chief administrator.
3. Recruitment of administrators from outside the organization is positively associated with innovation.

Griffiths proposes that the longer the administrator has operated within a system, the greater the probability that organizational processes have functioned to bring about equilibrium. For example, feedback channels for the maintenance of organizational homeostasis will have become fully established; a hierarchy of status among persons and sub-systems will have attained stability; sub-systems will have become structured and relatively independent; the frequency of interaction between sub-systems will have decreased; group norms that support the status quo will have developed.

This rationale and the work of others cited earlier suggest that innovation is not only inversely proportional to the length of tenure of the superintendent, but also inversely proportional to the length of tenure of the principal and mean length of tenure of the faculty.

Griffiths' model further implies that recruitment of the principal and superintendent from outside of the system is associated with innovation.[31] According to the model, feedback functions to maintain the sub-systems within the organization in equilibrium. The administrator who enters an organization from the outside receives little if any feedback initially from his actions, since well established channels for feedback to him do not exist.

Since he is not clearly informed as to the nature of the new organization, the administrator's behavior tends to be guided more by his conception of a hypothetical organization or an actual one with which he is familiar. Hence, his ignorance of limitations within the organization may lead him to disregard caution and initiate innovations which an insider with knowledge of the organization's problems would consider impossible to achieve.

It would appear that the tenure and recruitment propositions of Griffiths' model are especially relevant to the category of innovation chosen for this study because of its dependence for implementation on the formal leader. If these propositions are valid, they ought to hold especially for the case of structural innovation.

MAJOR HYPOTHESES

From a review of the literature and a consideration of the implications of Griffiths' model, the following hypotheses can be formalized:

1. There is a significant difference (P=.05) in mean length of tenure of superintendents of schools categorized as high, medium, and low on structural innovation.
2. There is a significant difference (P=.05) in mean length of tenure of principals of schools categorized as high, medium, and low on structural innovation.
3. There is a significant difference (P=.05) in mean length of tenure of faculties of schools categorized as high, medium, and low on structural innovation.
4. There is a significant difference (P=.05) in the ratio of outside to inside recruitment of principals of schools categorized as high, medium, and low on structural innovation.

5. There is a significant difference (P=.05) in the ratio of outside to inside recruitment of superintendents of districts of schools categorized as high, medium, and low on structural innovation.

Other investigators, including Ramstad,[32] have noted that size of school, size of district, and per pupil cost may have a significant bearing on the adoption of innovation. These findings suggest the need to investigate the connecti on, if any, of these variables and the adoption of structural innovati on. The following minor hypotheses can be formalized:

MINOR HYPOTHESES

1. There is a significant difference (P=.05) in mean expenditure per pupil in schools categorized as high, medium, and low on structural innovation.
2. There is a significant difference (P=.05) in mean size of district in schools categorized as high, medium, and low on structural innovation.
3. There is a significant difference (P=.05) in mean size of school in schools categorized as high, medium, and low on structural innovation.

RESEARCH PROCEDURE AND METHODOLOGY

To test the major and minor hypotheses of the study, the following procedures were employed. Schools were stratified into three groups on the basis of their adoption of four measurable structural innovations: (1) use of teacher aides, (2) team teaching, (3) variation in class size, and (4) variation in length of class meeting. The schools designated as the most innovative group had adopted three or more of the measurable

structural innovations, whereas those designated as the least innovative group failed to adopt any of the structural innovations. The middle group included those schools that had adopted at least one, but not more than two, structural innovations.

The reason for stratifying schools on the basis of number of innovations adopted was that it appeared to be the most reliable procedure for distinguishing schools on the basis of willingness to adopt structural innovations.

The minor hypotheses were tested before the major ones to determine whether the effect of these variables should be controlled through the analysis of covariance. These hypotheses were analyzed through use of Chi square to determine if differences exist among adoption groups and each of the variables--district size, school size, and expenditure per pupil, length of principal's tenure, length of superintendent's tenure, length of faculty tenure, recruitment of principal and recruitment of superintendent.

The relatively low zero order correlation of size of district, size of school, and expenditure per pupil and each of the tenure and recruitment variables suggested that the effects of these variables did not need to be controlled. Hence, the major hypotheses were tested using a one way analysis of variance procedure.

The independent variable for the test of the major and minor hypotheses was number of structural innovations adopted. Length of tenure of superintendent, length of tenure of principal, length of tenure of faculty, size of district, size of school, and expenditure per pupil were used as dependent variables, depending upon the major and minor hypotheses being tested.

The four structural innovations were defined operationally as follows:

1. Use of teacher aides--Paid adult assistants are to work in the school to assist teachers with such tasks as: (1) grading papers, (2) taking attendance, and (3) typing tests.
2. Team Teaching--Two or more teachers cooperatively plan for, instruct, and evaluate all of any part of the learning opportunities of a specific group of students.
3. Variation in Class Size --Some classes of at least twice the number of an average class of 30 are regularly scheduled. These classes are also regularly divided for class meetings into sections of approximately one half of the average class enrollment (15 or fewer students) for small group discussions. For example, a student might receive instruction in social studies twice a week in a group of 60 or more and three times a week in a group of approximately 15.
4. Variation in Length of Class Meeting--Some classes meet regularly for a period of time which is more or less than the average secondary school class of 45-60 minutes. For example, a student may meet his English class twice a week for periods of approximately 25 minutes and attend a regular foreign language class twice a week for 45-60 minutes or more.

INSTRUMENTATION

The instrument for data collection included four eight-point scales designed to collect information on the status of adoption of each structural innovation in the school and the opinion of the principal regarding the future status of each structural innovation. These scales were used only in terms of adopt-not adopt to stratify schools for the test of the major

and minor hypotheses.

SAMPLING

Questionnaires were sent to all public high schools in the State of California and Oregon. The rate of completed returns from California was 64%, whereas for Oregon it was 68%. Chi square tests for significant differences between responding schools and non-responding schools indicated no significant differences on each of the following variables: size of district, size of school, principal's tenure, and superintendent's tenure. It was concluded that it would be reasonable to generalize the results, based upon the usable responses in the sample to each of the states involved.

A further reduction in the sample was made to cull any school in which both principal and superintendent or one or the other assumed his position after the innovation. Since there was no feasible way of determining the contribution of the principal or superintendent who departed following implementation of the innovation, the only pure situation for the tests of the hypotheses was that in which both principal and superintendent assumed their positions prior to adoption of structural innovation.

This alteration reduced the number of schools used to test the hypothesis of the study to 105 in Oregon and 309 in California. Since there was evidence that the samples for each state did not differ from each of the two populations of schools on four variables (cited earlier), it was concluded that the results of each of the subsamples could be generalized to the principals and superintendents of each respective state who took their position before the implementation of a given structural innovation.

ANALYSIS OF THE DATA

Test of Significance for Minor Hypotheses

The minor hypotheses and results of their test are summarized below:

1. Hypothesis--There is a significant difference (P=.05) in mean size of district in schools categorized as high, medium, and low on structural innovation.
   Result--The level of significance for Oregon was (P=.05); for California, it was (P=.001).
2. Hypothesis--There is a significant difference (P=.05) in mean size of school in schools categorized as high, medium, and low on structural innovation.
   Result--The level of significance for Oregon was (P=.001); for California, it was also (P=.001).
3. Hypothesis--There is a significant difference (P=.05) in mean expenditure per pupil in schools categorized as high, medium, and low on structural innovation.
   Result--The level of significance for Oregon was (P=.18); for California, it was (P=.035).

The results of the test of the minor hypotheses indicate that minor hypotheses 1 and 2 are supported in each state. Hypothesis 3 was supported in California and, although the level of significance in Oregon was not as high, the results were in the hypothesized direction.

The substantiation of the minor hypotheses suggested the need to determine if the effect of size of district, size of school, and per pupil cost should be controlled statistically when testing the major hypotheses of the study.

Zero order correlations were determined between each of size of district, size of school, per pupil cost and each of the tenure and recruitment variables.

Because of the low degree of correlation and lack of a consistent pattern of correlation for each set of variables between states, it was decided that statistical control of size of district, size of school, and expenditure per pupil was not necessary in testing the major hypotheses.

TESTS OF SIGNIFICANCE FOR THE MAJOR HYPOTHESES

To conduct the analysis of variance, schools were grouped on the basis of adoption of structural innovation into three groups designated high, medium, and low according to the criteria cited on page 15. Length of tenure and ratio of outside to inside recruitment of superintendents or principals, depending upon the hypotheses tested, were treated in the analyses as the predicted variables rather than as prediction variables.

The hypotheses and the results of their tests are summarized below:

1. Hypothesis--There is a significant difference (P=.05) in mean length of tenure of superintendents of schools categorized as high, medium, and low on structural innovation.

   Result--This hypothesis was not supported in Oregon (P=.18) nor in California (P>.50).

2. Hypothesis--There is a significant difference (P=.05) in mean length of tenure of principals of schools categorized as high, medium, and low on structural

innovation.

Result--This hypothesis was not supported in Oregon ($P>.50$) nor in California ($P=.075$).

3. Hypothesis--There is a significant difference ($P=.05$) in mean length of tenure of faculties of schools categorized as high, medium, and low on structural innovation.

   Result--This hypothesis was not supported in Oregon ($P>.50$) nor in California ($P=.20$).

4. Hypothesis--There is a significant difference ($P=.05$) in the ratio of outside to inside recruitment of principals of schools categorized as high, medium, and low on structural innovation.

   Result--This hypothesis was not supported in Oregon ($P=.25$) nor in California ($P=.11$).

5. Hypothesis--There is a significant difference ($P=.05$) in the ratio of outside to inside recruitment of superintendents of districts of schools categorized as high, medium, and low on structural innovation.

   Result--This hypothesis was not supported in Oregon ($P>.50$). However, there was clear support for it in California ($P=.033$).

RELEVANCE OF SIZE OF SCHOOL, SIZE OF DISTRICT, AND EXPENDITURE TO ADOPTION OF STRUCTURAL INNOVATION

The results of the tests of the minor hypotheses indicated that in both states differences exist between each of the variables--size of school, size of district, and adoption of structural innovation. Inspection of the zero order correlation matrix indicates that a positive and significant ($P>.05$) association exists in both states between size of school and size of district. This relationship implies that the larger the district's enrollment, the larger the school enrollment.

Further examination of the correlation matrix indicates that a negative and significant ($P > .05$) correlation exists in both states between expenditure per pupil and size of school. It can be inferred from this result that the larger the school enrollment, the lower the expenditure per pupil.

Although it was not possible to obtain the correlation of expenditure per pupil and adoption of structural innovation due to the categorical nature of the adoption variable, it was possible to determine the correlation of expenditure per pupil and the school's position toward adoption of each of the four separate structural innovations.

The zero order correlation matrix indicated that expenditure per pupil in both Oregon and California and school's position toward adoption of each of the structural innovations was negatively associated. This finding provides indirect evidence for the belief that high expenditure per pupil may be negatively associated with adoption of innovation.

Wilson's and Bishop's findings provide clues as to why large schools tend to adopt structural innovations in greater number than their smaller counterparts. Wilson[37] found, in a recent study in the state of Ohio, that size of school and preparation of teachers was highly related; that is, the best prepared teachers taught in the largest schools. Bishop[38] found that a positive relationship existed between size of school and degree of bureaucracy. He[39] also found that a positive relationship existed between degree of bureaucracy and adoption of educational change. His definition of extent of bureaucracy assigned a higher place on this variable to schools that included more specialized personnel.

Together, the findings of Wilson and Bishop indicate that larger schools are characterized by better prepared teachers who are able to specialize in their teaching assignments. Their better preparation and their specialization may account for their universal interest in and ability to initiate certain types of innovation.

It is difficult to interpret the expenditure hypothesis because of the discrepancies between states regarding its support. Further, because of the categorical nature of the variable, adoption of structural innovation, the unique variance in explaining adoption of structural innovation accounted for by expenditure per pupil could not be determined.

The findings of this study, nevertheless, do suggest that the relationship between expenditure per pupil and adoption of structural innovation appears to vary from state to state. Further research whose objective is to test the extent of variation of the relationship between expenditure per pupil and adoption of structural innovations is needed before any reasonable inferences can be made regarding the effect of this variable and adoption of structural innovation.

THE RELEVANCE OF TENURE AND RECRUITMENT TO ADOPTION OF INNOVATION

Perhaps the most unexpected finding of this study is the failure to support the belief that length of tenure of superintendent, principal, and faculty differs significantly among public high schools stratified on number of structural innovations adopted. By extension, it can be inferred from this finding that the probability that differences among these variables and adoption of educational change is low.

Although the belief is held that as the superintendent, or principal, or faculty increase in tenure, they also increase in complacency, the results of this study suggest that it can be argued equally as well that administrators of long tenure also foster change.

Another outcome of the tests of the tenure hypotheses is especially relevant for the development of a theory of change in schools. The failure to verify the hypothesis that length of tenure of superintendents differs among schools stratified on the basis of adoption of structural innovation casts some doubt on one of Griffiths' basic theoretical propositions--that length of tenure of the chief administrator is inversely related to acceptance of innovation. Furthermore, the failure to verify the tenure hypotheses for the principal and faculty (both derived from Griffiths' theory of administrative change) casts additional doubt on this proposition.

The failure of data in both states to support the hypothesis that the ratio of outside to inside recruitment of the principal differs among schools stratified on the basis of adoption of structural innovation indicates that school boards do not necessarily select principals from outside the system to implement changes. Outside selection of the principal may reflect the unavailability of qualified successors within the system rather than the need for going outside to find change agents.

The support of the hypothesis in California that the ratio of outside to inside recruitment of the superintendent differs among schools stratified on the basis of adoption of structural innovation and the lack of support in Oregon presents an equivocal finding. In the state of California Griffiths' proposition that outside recruitment of the chief administrator is positively associated with change appears to be substantiated; whereas, the results of the Oregon sample case doubt on its validity.

Carlson[40] provides a rationale for explaining these different findings. He argues that if the administration of the school system is perceived by the school board as unsatisfactory, the appointment of a successor will go to an outsider; whereas, if the administration is perceived as satisfactory, the appointment will go to an insider or outsider. This rationale is based upon an important assumption that appears to hold for California but not for Oregon. That assumption is that persons qualified for the superintendency by training, credentials, and exerience are available within all school systems.

The assumption that qualified personnel are available within school districts appears more plausible for the state of California because of the comparatively greater number of larger schools and districts[41] and the finding by Wilson[42] that superior qualifications of teachers are directly related to size of school systems.

SUGGESTIONS FOR FURTHER RESEARCH

The results of the tests of the minor hypotheses of this study indicated that in both states differences exist between each of the variables--size of district, size of school, and school's position on adoption of structural innovation. These findings provide evidence for the supposition that a relationship may exist between each of these variables and adoption of structural innovation. Thus, further investigation concerning each of their relationships and adoption of structural innovation appears warranted.

In this study, adoption of structural innovation was treated as a categorical rather than a continuous variable. The categorical treatment of adoption of structural innovation prevented the testing of the relationships between each of the variables of the minor and major hypotheses.

If data on adoption of structural innovation are collected so that this variable can be treated using multiple regression techniques, then the unique contribution of each of the variables--size of school, size of district, expenditure per pupil, length of tenure of superintendent, length of tenure of principal, length of tenure of staff, recruitment of principal, and recruitment of superintendent--could be determined.

It is recommended that a replication of this study be made with modifications that enable the researcher to test the relationships between each of the variables considered in the major and minor hypotheses and adoption of structural innovation. Further, if a replication of this study is made, the variable adoption of structural innovation, should be defined so as to permit the use of multiple regression techniques. Finally, to facilitate interpretation of the findings, the study should be limited to schools that are relatively uniform in size.

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[39]Ibid.

[40]Richard O. Carlson, Executive Succession and Organizational Change (Chicago, Illinois: Midwest Administration Center, 1962), pp. 17-18.

[41]Recall, for example, that over 50% of the high schools in Oregon have average daily attendance of from 1-600 as compared to only 1/4 of the high schools in California. Further, over 50% of the school districts in Oregon have average daily attendance of from 1-1,000 as compared to approximately 1/4 of those in California.

[42]Wilson, loc. cit.